**STUDY ON THE DISTRIBUTION OF BAIKALIAN SPONGES.** *Memoirs of the Queensland Museum 44: 368. 1999*:- Freshwater sponges are classified into three families. Spongillidae, Potamolepidae and Lubomirskiidae. Spongillidae are cosmopolitan sponges and widely distributed throughout the world, Potamolepidae are found in lakes of Africa and South America, and Lubomirskiidae inhabit only Lake Baikal. One of the characteristics of Spongillidae is gemmule formation. Gemmules are asexual bodies with a structure in highly resistant resting stages. Most Japanese sponge species form gemmules, but a certain species which forms in the shallow zone of lakes, does not form gemmules in deeper zones. Therefore we have a great interest in the Lubomirskiidae of Lake Baikal which does not produce any gemmules. At present, the taxonomy of some Lubomirskiidae is in a chaotic state. Furthermore, the recent distribution of Baikalian sponges has not been recorded. We decided to collect as many Baikalian sponges as possible and to review their taxonomy and their distribution in Lake Baikal. About 700 specimens were collected, mainly from the entire littoral zone of Lake Baikal, but some specimens were collected from the Academishan ridge by a dredge survey, and others collected on diving surveys. Most of the specimens belonged to the family Lubomirskiidae, with a few belonging to the family Spongillidae. Lubomirskiidae were classified into three genera and eight species according to Rezvoy. Based on the results of our study, our Lubomirskiidae specimens were tentatively classified into 4 genera and 11 species. At the present, Lubomirskiidae are classified mainly by their spicules and skeletons, not by the form of the sponges (changeable due to substrate and water current), oscula or colour (thought to not contain pigment cells). The colour of green sponges is owing to symbionts, zoochlorellae.

The Lubomirskiidae species were distributed throughout the entire littoral zone of Lake Baikal, except where the substratum was sand, mud or pebbles. On the other hand, Spongillidae species (*Spongilla lacustris*, *Ephydatia muelleri* and *Eunapius* sp.) were collected from only four stations. Lake Baikal may be an in appropriate habitat for Spongillidae species. Spongillidae lack of presence throughout the entire littoral zone may be due to; the amount of nutrients, wave action and water temperature. Regarding nutrients, certainly Lake Baikal is characterised by oligotrophy when compared with other lakes where many Spongillidae species live, but the limits within which the Spongillidae species can not live is unknown. Lubomirskiidae may be accustomed to poor food. Due to the weak and fragile bodies of Spongillidae, they cannot live in an area of strong wave action. But the wave action in deeper zones is weaker than that in shallow zone. In Lake Biwa, in Japan, Spongillidae species can live at a depth of 30m, where the wave action is weak. In Lake Baikal, wave action is also weak at such a deeper zone. But we could not find Spongillidae even at a depth of 30m. We compared the maximum temperature in Lake Baikal and Lake Biwa during the year at a depth of 30m. In Baikal, the maximum temperature is about 6°C. On the other hand, in Lake Biwa, it is about 10°C. The maximum temperature may be an important factor for the survival of Spongillidae species. More detailed information on differences in the two family habitats is necessary to resolve this problem, which is important in the analysis of spicules in old sediment.

The spicules of freshwater sponges are very stable in old sediment because they consist of silica components, such as diatoms, and we are now studying the spicules of old sediment obtained from drilling cores. Some spicules from sediments, believed to have been deposited there 4,500,000 years ago, were found about 180m under Lake Baikal. If Spongillidae spicules are found, we might hypothesise the lake's conditions as being similar to the Little Sea near Olkhon Island at present. If we examine spicules along the drilling core from surface to bottom, we might find successive changes in the circumstances. Furthermore, if we should find new spicules not seen in recent sponges, the new finding would help us in drawing up the phylogenetic tree of freshwater sponges. ❐

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